Estimating and Projecting Impervious Cover

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Urban/suburban land use is the most rapidly growing land use class. Along with increased development inevitably comes increased impervious surfaces—areas preventing infiltration of water into the underlying soil. The alteration of watersheds associated with impervious cover is the most difficult impact of urbanization on waterways to control and correct. Effects of increased impervious cover include detrimental hydrologic changes, stream channel erosion, habitat degradation, and severe impairment of aquatic communities. Development practices that reduce impervious area and include preventative strategies to protect water quality are more effective and less costly than remedial restoration efforts. Effective methods to estimate and project impervious cover can help identify areas where a watershed is at risk of changing rapidly from one with relatively pristine streams to one with streams with significant symptoms of degradation. In collaboration with U.S. Environmental Protection Agency (U.S. EPA) Region 4, a Geographic Information Systems approach using multiple data sources was developed for estimating and projecting impervious cover for small watersheds over a large area. These estimates and projections provide an inexpensive tool to help states identify and mitigate increasing urban water quality problems. The estimation and projections techniques were applied to the eight southeastern states in Region 4, providing the region with a screening tool to guide monitoring and aid in educational efforts. Multiple sources of data include U.S. Census Bureau 1990 and 2000 census data, National Land Cover categorized satellite imagery data derived from remote sensing data, and highway information. Finally, county scale population projections obtained from the individual states were combined with the multiple data source estimation technique as the basis for projecting future impervious cover in the eight Southeastern states. These estimates and projections can guide *in situ* monitoring to confirm problems, aid listing of impaired waters under Section 303(d) of the Clean Water Act and total maximum daily load (TMDL) development, provide reliable scientific information to energize sound local planning and land use decisions, and promote protection and restoration of urban streams.